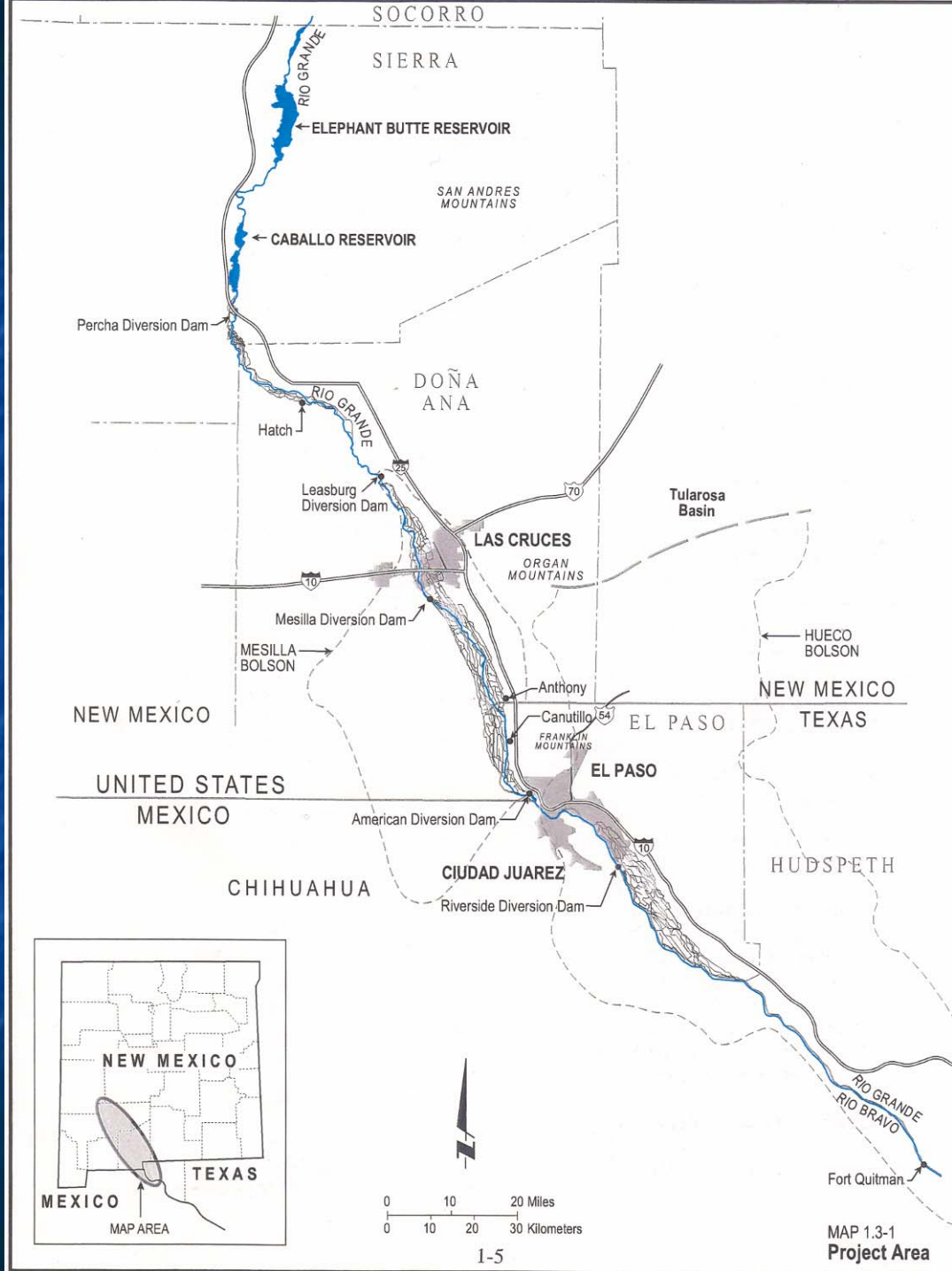
Rio Grande Canalization Collaborative Project

Beth Bardwell, Program Officer
World Wildlife Fund
Chihuahuan Desert Program

J. Phillip King, Assc. Professor
New Mexico State University
Department of Civil Engineering

Canalization Project Objectives

- Federal (US Section of the International Boundary and Water Commission - IBWC) project to regulate and control water supply to US and Mexico
- Convey water from storage to Rio Grande Project diversion points more efficiently
- Provide flood control for agricultural and municipal lands in New Mexico and Texas
- Stabilize river channel to protect property and improvements



Scope of the Canalization Project

- 105 mile reach of Rio Grande (Percha Dam, NM to American Dam, El Paso, TX)
- Constructed from 1938 to 1943
- Federal acquisition of river channel and adjoining floodway
- Clearing and leveling of 3,400 acres of floodplain
- Construction of flood control levees on 2/3 of river reach (131 river miles)
- Dredging of uniform pilot channel for 95 miles of river reach
- Removal of 10 river miles of meanders to straighten channel

Canalization in the Mesilla Valley

Southern New Mexico Agriculture

Cotton

Alfalfa

- ~70,000 acres in annual production
- Three top crops are pecans, alfalfa and cotton
- Full supply allocation is a little less than 500,000 acre-feet of water
- Gross sales of agricultural products from Dona Ana County over $200 million (1997 Agricultural Census)

Crop	Water Delivery (AF)
Alfalfa	5.0
Cotton	3.0
Pecans	5.5

Unintended Environmental Consequences of Rio Grande and Canalization Projects

- Change in hydrology
  - Spring pulse
  - Low summer flows
  - Winter base flows
  - reduction in variation in flows
- Change in channel processes and geomorphology
  - channel avulsion
  - creation of new floodplains and erosion of old floodplains
  - uniform channel reinforced with riprap

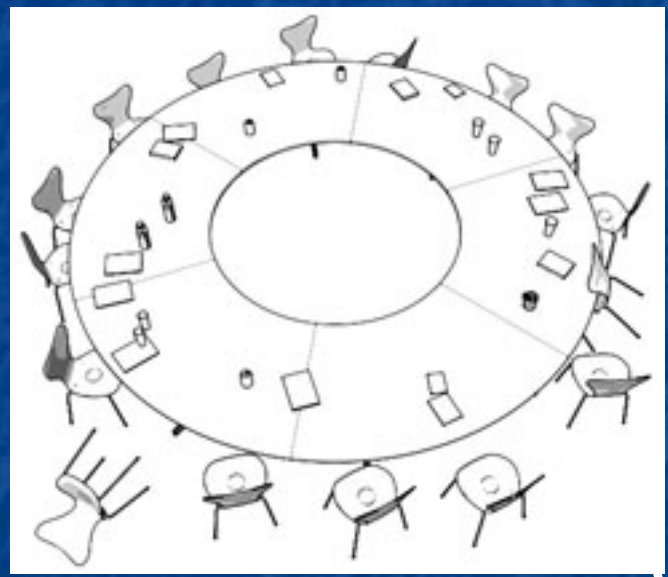
Unintended Consequences of Canalization Project

- Loss of diversified aquatic habitats
  - Backwaters
  - Pools
  - Eddies
  - Meanders
- Loss of diversified riparian habitats
  - Wetlands
  - Riparian forests
  - Grasslands

Importance of Habitat Enhancement in Canalization Project

- Only 1% of all lands in the arid southwest are riparian
- Riparian woodlands are a keystone habitat
- The Desert Rio Grande is one of only three large river habitats in 250,000 square miles of Chihuahuan Desert

- 1999 to 2004 EIS on the future operation and management of the Canalization Project
- Stakeholders share universal interest in reexamining the preferred alternative
- Conservation groups find proposed habitat enhancements nominal
- Farmers fear presence of endangered species on restored lands may restrict water operations and management for irrigated agriculture and want protection of long standing usufructory rights to Rio Grande surface flows
- IBWC delays issuance of the Record of Decision and commissions new studies



Genesis of Collaboration

The Collaborative Project

Members:

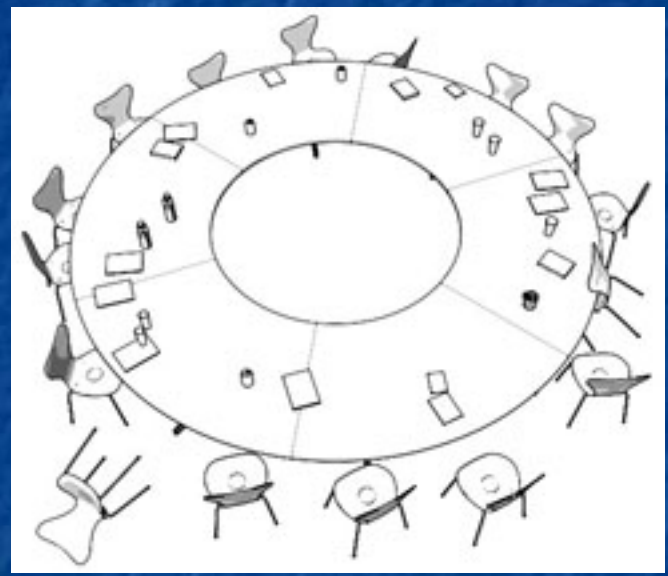
-Elephant Butte Irrigation District

-World Wildlife Fund

-Environmental Defense

-International Boundary and Water Commission (IBWC)

-30-member Stakeholder Workgroup



Goals of the Collaborative Project

- Find an alternative operation and management paradigm to “fish versus farmer”
- Real world solutions to competing uses of water in water limited ecoregion--the Chihuahuan Desert
- Integrate flood control and conveyance functions with habitat restoration

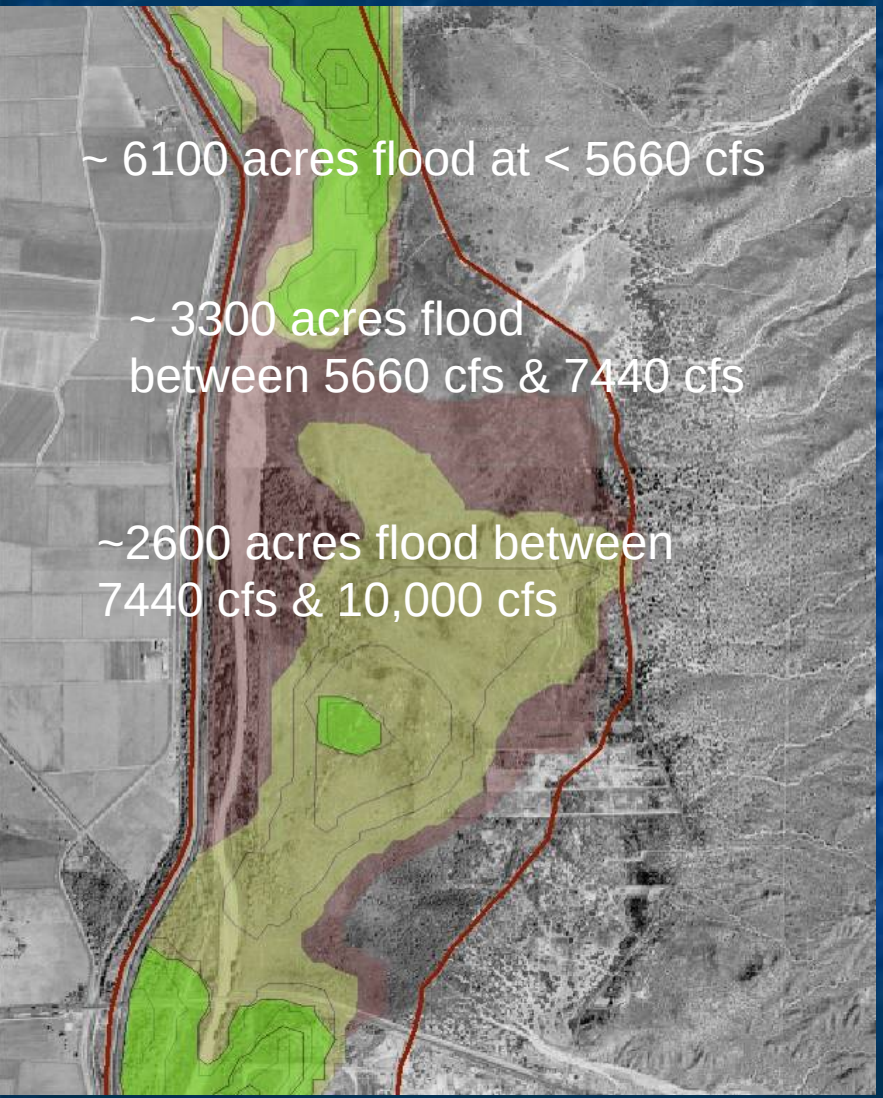
Methods for Analyzing Opportunities for Integrated River Management

- Hydraulic and flood routing models
- Biologic studies
- Legal Analysis to Find Flexibility Under ESA
- EBID and New Mexico Legal and Administrative Framework for Management of and Accounting for Environmental Depletions

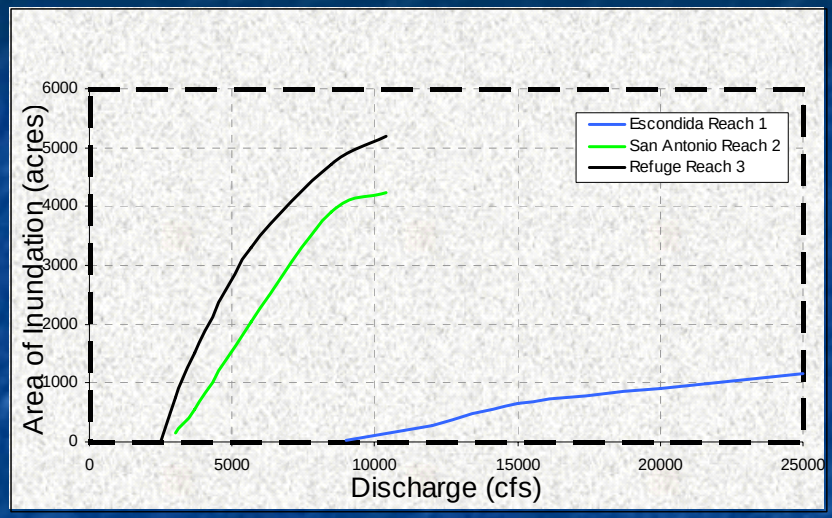
Assessing Flows for Floodplain Restoration

- Using FLO-2D, a 2-dimensional flood routing model, to identify areas of inundation
- Model flows from 2500 cfs (peak irrigation flow) to 5000 cfs in 500 cfs increments
- Ability to time flows with riparian seed dispersal and irrigation demand to maximize use of carriage water by downstream users
- Flood frequency with a return event of every 2 to 3 years
- Develop restoration hydrograph with focus on descending limb to optimize recruitment of cottonwoods and willow seedlings
- Estimate water budget for evapotranspiration at restoration sites and water delivery
- Quantify impacts of environmental flow on flood control and water supply and deliveries

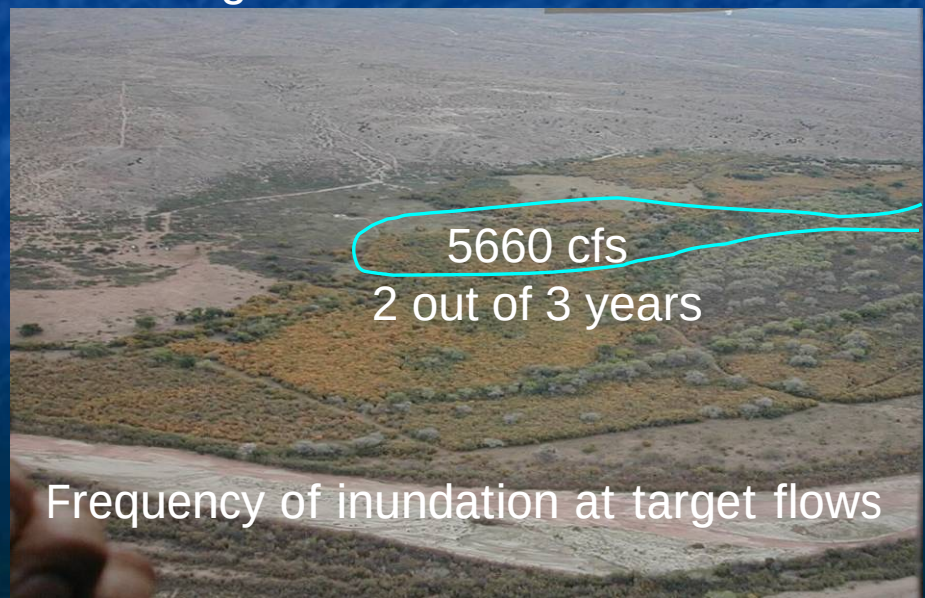
FLO-2D GIS Interface and Information Products



Map of areas and depth of innundation at target flows



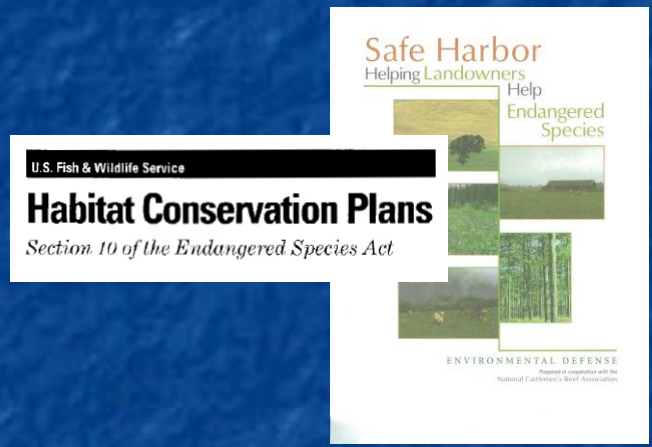
Area of inundation as a function of discharge



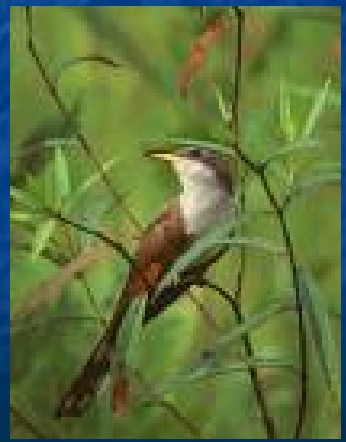
Frequency of inundation at target flows

Flexibility Under the ESA

- **Safe Harbor Agreements**
  - Basic premise: Non-federal landowner who voluntarily restores habitat for endangered species should not be penalized with future restrictions on landuse or water operations
  - Agreement sets out what actions must occur and duration of those actions
  - Does not free landowner from ESA obligations if endangered species already occupies land
- **Sec. 10 Habitat Conservation Plans (HCP)**
  - Landscape level plan to minimize and mitigate authorized “take” of endangered animals including significant habitat modification
  - Example is Roosevelt Dam and Reservoir HCP which provides mitigation for inundation of Flycatcher habitat in reservoir headwaters



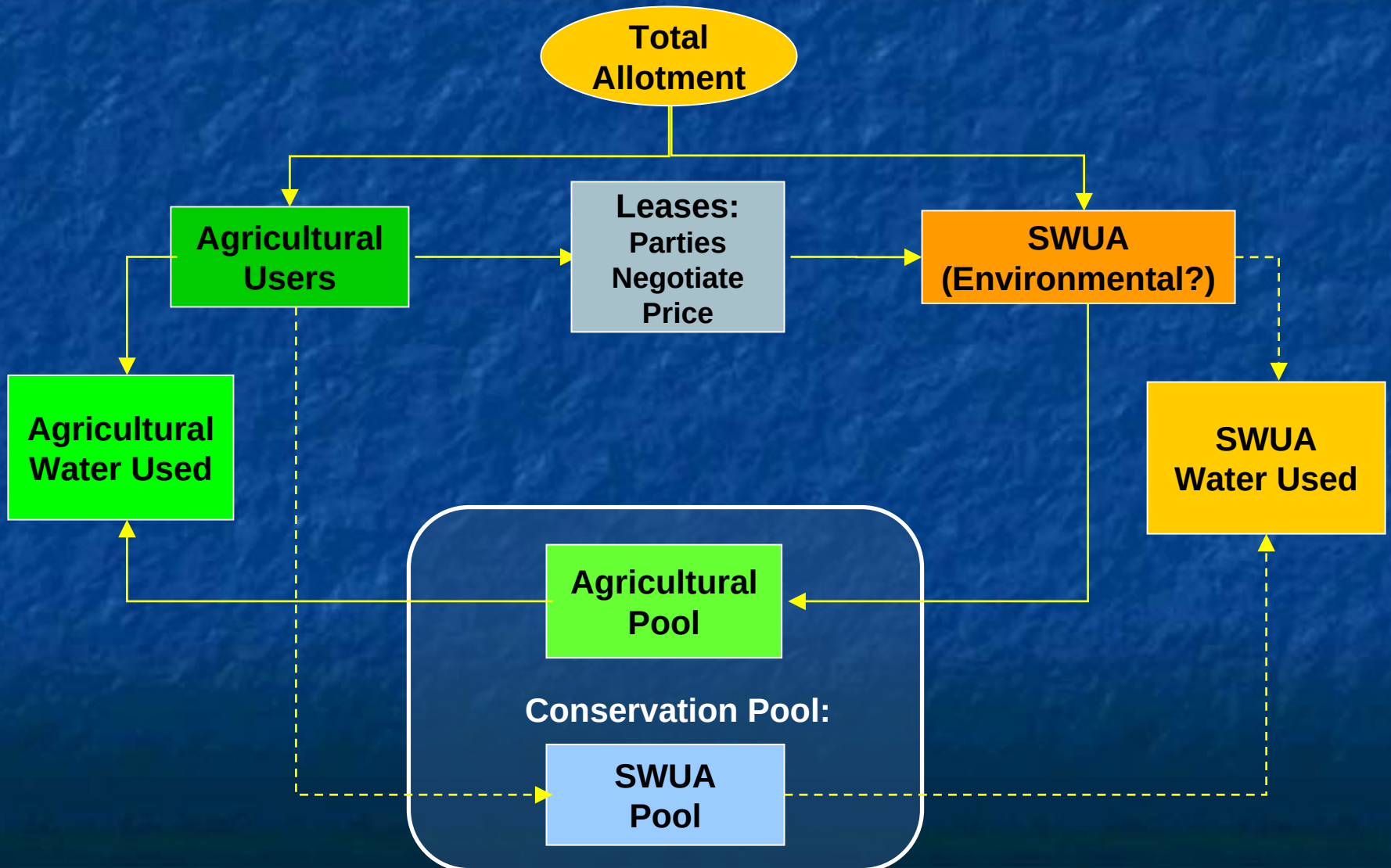

Southwestern Willow Flycatcher


Yellow-billed Cuckoo

Institutional Framework for Management of Environmental Water - SWUAs

- EBID Policy 2003-GA8, approved November 19, 2003
- 73-10-48 NMSA
- Assessed as EBID constituents
- Share pro rata in shortages
- Surface water rights maintain EBID's 1906 priority date
- SWUA must lease all of the water from a parcel; land must be fallowed
- Special Combined Unit: Small tracts (<2 acres) can be consolidated and treated as farm tract for ordering and billing
- Maintained as Ag use until demand for direct M&I use develops

Template for Transfers of Water to Special Water Users Associations



Current Status

- Collaborative group developed scope of work for Army Corps of Engineers technical work
- Corps currently performing hydrology, geomorphology, biological baseline studies
- First stakeholder meeting held December 12, 2006
- Baseline studies to be completed inJune
- Second stakeholder meeting to be held in June/July 2007

To Learn More Visit

http://www.ibwc.state.gov/html/canalization_eis.html